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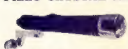
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EDITORIAL

★

The Use of Foreign Languages

FROM the inception of Amateur communication — particularly phone communication — Amateurs the world over, as a matter of normal habit, learned simple phrases and sentences of the other man's language which enabled him to converse more readily, at least to the extent of having an intelligent, even if short, QSO.

Thus it was until a few years ago when a Queensland Amateur was told he must cease speaking in French to a French Amateur who himself was permitted to speak in English. Both the Amateur and the French Amateur Society (R.E.F.) concerned represented the case to the Wireless Institute of Australia.

The Institute insisted that this was an incorrect interpretation of the Regulation and the Postmaster-General's Department rescinded its "you must speak English" attitude and gave notice that Australian Amateurs would be permitted to speak "plain language messages in any recognised foreign language."

For several years afterwards freedom of speech in respect of the Regulation was carried on by Australian Amateurs without any known case arising involving an Amateur in

doing other than conduct an overseas contact in conformity with the conditions laid down for the operation of an Amateur Station.

Then for reasons of "security" and the "international situation" Amateurs were again banned from speaking in other than the English language, whilst broadcasting services and small ships transmissions continued using foreign languages without restriction.

Amateurs in Australia, as British subjects, and virtually "screened" before being issued with a license to transmit, should be beyond reproach when it concerns the security of our fair land, and the Institute was perturbed by the bad and erroneous reports coming from overseas — from the very countries from which the international goodwill of the Amateur Service derives its status.

The Postmaster-General has now seen our point of view, so once again freedom to speak in the language of the other man is available to the Australian Amateur. May the Amateur Service continue to function as the greatest exponent of international goodwill. The Amateurs of Australia thank you, Mr. Davidson.

FEDERAL EXECUTIVE.

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T_j max. (continuous operation).....	90°C
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Amateur Radio, February, 1961

A.M. Without Splatter

R. G. ROPER,* VK5PU

● This interesting article is a summary of a lecture given to the VK5 Division at one of their monthly meetings.

IN these days of s.a.b., d.s.b., f.m., and t.v.i. it is considered definitely "non-U" to even mention a.m., let alone devote a lecture to the subject. However, ancient (sorry, amplitude) modulation is used by over 90% of active Amateurs, and remains a most useful method of communication.

To the conscientious newcomer to Amateur Radio, one fact becomes quickly obvious. If he sets up his rig so that it is modulated 100% on voice peaks, he is immediately informed by any station he contacts that his signal lacks audio. He then applies the usual remedy, namely, the wick is wound up until the report from the other end is "loud and clear". The "and clear" is covered by a proviso; the modulator must be able to produce the required audio with tolerable distortion, and the final must have a reasonably high modulation capability. The only troubles arising from this procedure, as our new Amateur soon discovers, are an increase in interference problems. Neighbours complain that their favourite t.v. programmes are being torn up at odd intervals and local Amateurs mutter that the bands are rendered useless whenever that new young so-and-so is on. "Mutter" is used purposely; outright condemnation is seldom forthcoming since most Amateurs have come to accept splatter as a natural outcome of a.m., mainly because they have all adopted the same "winding up the wick" technique to "fill up their carrier" with more audio.

CAUSES OF SPLATTER

There are several factors which can cause splatter. Such things as over-driving an already over-rated modulator or piling audio onto a final with low modulation capability will produce splatter, and the remedies are obvious. However, by far the worst source of splatter is negative-peak clipping by the final, i.e. exceeding 100% modulation in the downward or negative direction. This is akin to a rapid switching on and off of the final h.t. and produces a series of splashes similar to those produced by a c.w. transmitter with no key-click filter. The modulator also contributes to this splatter, and this source will be treated in detail later.

VOICE POWER

In considering methods of increasing the amount of voice power which can be transmitted, it is necessary to first consider the nature of the speech waveform. One factor which is not always appreciated is that the predominantly unidirectional flow of air past the vocal chords produces an asymmetry in the compressions and rarefactions making up the vocal sounds. This asymmetry is preserved by the microphone, which produces an output voltage waveform having voltage peaks in one direction anything up to three times those in the opposite direction.

If the number of stages in the speech amplifier and modulator is such that these higher voltage peaks modulate the final in the upward direction, considerably more audio can be applied to the final before negative-peak clipping occurs than if these peaks modulate the final in the downward direction.

Try reversing the connections to the modulation transformer primary (or secondary, but not both at once!) and determine which connection enables the wick to be turned up the furthest before negative-peak clipping commences. A c.r.o. should really be used to make this test, but the connection which produces the least modulation transformer talk-back for a given gain setting is the one to use.

A further investigation of the speech waveform reveals that its average power is only some 25% of its peak power. The usual method of raising the average power is clipping and filtering, and this can be done most efficiently at low levels. Good clipper/filter circuits have been described in overseas publications, and also in an Australian magazine.

The incorporation of a.g.c. in the speech amplifier is well worth while, since this keeps the voice level constant and applies full clipping at all times. The one disadvantage of such a system is the fact that background can become objectionable, but this is so in very few locations.

For intelligibility, while retaining voice individuality, a bandwidth of from 300 cycles to 3 kc. is adequate. Most of the power of the male voice is concentrated in frequencies below 500 cycles; these contribute little to intelligibility, and are, indeed, a liability, since, if not attenuated, they can cause ringing of the low-pass filter inherent in a clipper filter design, markedly reducing readability. Low frequency de-emphasis should therefore be applied before clipping. This is most easily achieved by the use of 470 pF. coupling capacitors between stages before the clipper.

Once the speech waveform has been clipped and then filtered to restrict the upper frequency limit of the distortion products generated by the clipping process, subsequent amplification can produce phase shifts which will result in peaking of the clipped waveform. This is undesirable, since it reduces the average to peak power ratio, and hence reduces the average power able to be applied to the final before overmodulation occurs. To minimise this undesirable phase shift, the low frequency response of the stages following the clipper/filter should be as good as possible. This includes the low frequency

response of the modulation transformer, which is improved by the capacitor/choke coupling described later.

AMOUNT OF AUDIO

The performance of the modulator has now been considerably improved, but one factor has been overlooked. To plate modulate a final amplifier 100%, an amount of audio equal to 50% of the final input is required. This statement appears in most text books, and is accepted as gospel by most Amateurs. However, the statement is true only if the modulating waveform is a pure sine wave, which is far from being the case with clipped speech. If the modulating waveform is a square wave, then the audio power required for 100% modulation is equal to the final input power.

The clipped speech wave lies somewhere between these extremes, and the modulator must be capable of producing this power if clipping and filtering is not to be wasted, i.e. if the final input is 100 watts, then the modulator should be capable of producing an average 100 watts of audio.

Previously, without clipping, the modulator was required to produce 50 watts on voice peaks, the average power requirements being considerably lower than this. This kind of power can be obtained from modulator tubes using cathode bias, but these types are definitely out for the new requirements unless the final input is reduced to 50 watts.

Possibly the best modulator for running the legal limit is a pair of zero-bias 807s, but the 811A should not be overlooked. With 750 volts on the plates, a pair of 811As will produce over 200 watts of audio, and are ideal if high-level clipping is to be used also.

Most readers will, at this stage, be thinking, "Well, that fixes me. I've only got a 50 watt mod. tranny, and I can't expect to get 150 watts out of it without blowing it up!" Have courage, men! There is very little chance of "blowing up" a 50 watt mod. transformer by trying to make it take more than its rated power. In most cases, it just won't pass the extra, not because of current or voltage limitations, but because of core saturation. With the d.c. current of the final flowing through the secondary, the core has a considerable magnetic bias. One tube of the class B modulator will draw current for one half-cycle of the modulating frequency which will tend to cancel this bias. Unfortunately, this is the half cycle which is reducing the final plate voltage, i.e. the negative modulation cycle. The other class B tube will provide a pulse (on the other half cycle) which increases the core bias and, if large enough, produces core saturation and peak clipping on the positive modulation cycle.

If, however, the final d.c. current is removed from the secondary, the positive modulation half cycle may be increased to twice the previous value

* 21 Leslie Street, Woodville, S.A.

before core saturation occurs. This corresponds to an increase of four times in power handling capability. What was a 50 watt transformer with d.c. in the secondary, is a 200 watt transformer with the d.c. removed.

The easiest way to effect this removal is to feed the final h.t. through an audio choke, earth one end of the mod. transformer secondary, and connect the other end to the top of the choke via a capacitor (see Fig. 1). The choke should have a minimum inductance of 10H, and be capable of passing the final plate current. Insulation requirements are fairly stringent; the choke must be able to stand an audio voltage equal to the h.t. across it, and twice (preferably three times) this voltage from winding to core. The latter is the most difficult to satisfy; the difficulty can usually be overcome by isolating the core from ground by mounting the choke on stand-off insulators. Never touch this choke while the h.t. is on; a core-to-winding short will bring the body of the choke to h.t. potential. [For safety, place an earthed shield over the choke.—Ed.] The capacitor should be 2 μ F, or greater and have a working voltage rating at least equal to the final h.t. A lower voltage capacitor can be used if the other end of the mod. transformer secondary is connected to the power supply end of the plate feed audio choke, instead of to ground.

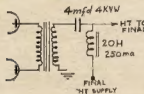


Fig. 1.

Removing the secondary d.c. also increases the low-frequency response of the transformer, which is to the good if a clipped waveform is being handled.

Even when all the above modifications have been made, splatter is still possible, due either to distortion introduced by the modulator, or by once again winding up the wick after the clipper. This can be prevented by the use of a high level clipper and filter.

High level clipping introduces higher order harmonics just as does low-level clipping and these, without a subsequent filter, will produce splatter. The clipper usually used consists of a diode capable of carrying the final current, in series with the modulated h.t. to the final. This series limiter suppresses negative peak clipping in the modulated r.f. amplifier which results from large amplitude negative peak modulating signals. The high level filter removes not only the transients due to the limiting action of the series diode, but also high order harmonics due to modulator distortion.

THE MODULATOR

As mentioned previously, there is another source of splatter in over-modulation of a final: this splatter originates in the modulator and has received very little attention in the past. Provided the final is operating in class C, its plate voltage/plate current char-

acteristic is linear, i.e. it presents the same resistive impedance throughout the modulating cycle for modulation percentages up to 100. However, once the plate voltage on the final becomes negative when overmodulated, the impedance offered to the modulator is infinite. (Actually it is the sum total of the series impedance offered by the modulation transformer leakage reactances, the last filter condenser in the final supply, and the final plate by-pass capacitor, which total is large at audio frequencies.)

The disastrous consequences of operating a class B modulator without load are well known. Extremely high voltages are developed across the windings of the mod. transformer, which can lead to insulation breakdown and subsequent destruction of the transformer or class B tubes. Fortunately, most transformer manufacturers have included in their products a spark gap which arcs over before insulation is punctured.

Contrary to popular belief, transformer talk-back is not always due to lamination rattle, but is usually due to arcing, producing an arc which sings at the modulating frequency. The transients associated with this arcing are coupled to the final tuned circuit via the h.t. line, producing damped oscillations peaking at the tank resonant frequency. In the author's opinion, this, rather than the negative peak clipping by the final, is the main source of splatter. The use of a high level clipper filter will remove these transients, but the dangers of tube or transformer breakdown in the modulator still remain, and talk-back can produce annoying feedback if a high gain speech amplifier is in use.

The incorporation of a diode and series resistor between final h.t. and earth after the modulator, but before the clipper filter will provide a load for the modulator when the top of the mod. transformer secondary becomes negative with respect to earth. Note that this is not the so-called negative cycle loading which is assuming some popularity in this country. Negative cycle loading works because it minimises the possibility of the application of negative pulses to the final, and prevents open circuit of the mod. transformer secondary, which are the main causes of splatter, but it does introduce distortion and should be used in conjunction with a high level filter if these distortion products are not to widen the signal spectrum. Negative cycle loading is also a power waster, since

modulator output power is dissipated in the loading resistor as soon as the final voltage falls below the quiescent carrier condition, whereas in the circuit of Fig. 2 the modulator load diode and resistor dissipate only power which cannot be applied to the final anyway.

HIGH LEVEL CLIPPER FILTER

Fig. 2 is the circuit of a high level clipper filter incorporating all the above mentioned facilities. Provided the modulation capability of the final is high (preferably triodes with plenty of

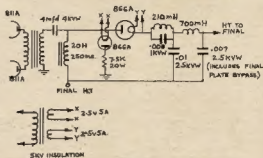


Fig. 2.

drive, but watch out for harmonic output from any hard-driven final), and the modulator can deliver the power, up to three times the amount of audio required for 100% modulation can be applied without splatter. If a low level clipper and filter is used also, this means 300 watts of audio on 150 watts of carrier input. Some loss of voice individuality is, of course, inherent in this practice.

A word of warning. Because of the asymmetry about the carrier level of the resultant final plate voltage after high level clipping and filtering, the average plate input will rise with modulation. If 100 watts of audio is applied to what is nominally 100 watts input without modulation, the average input will rise to 116 watts. To comply with regulations, a station running the legal limit will have to proportionately reduce the final input as more audio is applied.

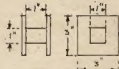


Fig. 3.—Details of inductance bobbin.
300 OH, 2,500 turns of No. 36 S.W.G. enam.
210 mH, 515 turns of No. 24 S.W.G. enam.

If the modulation transformer is set up to match the modulator tubes with the secondary at 7,500 ohms, then the filter network shown will work satisfactorily for any final whose impedance lies in the range from 5,000 to 10,000 ohms. The two filter inductances are air cored and wound on similar wooden formers, and should be mounted with their axes at right angles to minimise inductive feedthrough. Glue the ends to the formers, and mount on wooden blocks. Do not use any bolts or nails (brass or otherwise) since these can considerably reduce the effective Q of the coils and adversely affect the filter characteristics.

A V.F.O. FOR 9 Mc. S.S.B.— BY A BC458 CONVERSION

J. K. HERD,* VK3JK

PROBABLY the most stable oscillator available at present for use with 9 Mc. type s.s.b. exciters is the versatile Command transmitter. Preferably, the 5.3 to 7 Mc. BC458 is more easily converted, or next in favor is the 4 to 5.3 Mc., but this one needs some three turns removed from the top of the oscillator coil.

I will not go into the matter of general alteration, but briefly it amounts to putting all filaments in parallel for 12 volt operation and removal of all superfluous wiring, as well as removal of the two relays and neutralising condenser. (All wiring associated with the m.o. (1626) is left untouched and the conversion commences from T53 coil C—refer to original circuit of BC458 shown. The "magic eye" wiring may be removed if required.—Ed.)

The rotary ceramic antenna coil and all its hardware, likewise, comes out to make room for a switch and condenser on the front panel.

The one here has a piece of aluminium bolted inside the front panel above the chassis and, in the space which previously held the graduated window, a 0-100 pF. air trimmer (0-50 pF. will do) and a switch—single bank 2-pole 8-position, either bakelite or ceramic, preferably the latter—has been located.

The second 1625 tube, V2, is retained and performs as a frequency multiplier and simplifies the production of correct injection frequencies for the various bands, which are as follows:—

- 3.5 Mc. = 9 Mc. — 5.5 Mc.
- 7 Mc. = 9 Mc. from 16 Mc.
(3 × 5.3 Mc.)
- 14 Mc. = 9 Mc. + 5 Mc.
- 21 Mc. = 9 Mc. + 12 Mc.
(2 × 6 Mc.)
- 28 Mc. = 9 Mc. + 19 Mc.
(3 × 6.3 Mc.)

The metal can condenser (3 × 0.05 μF.) should be removed and either ceramic disc or mica used in place thereof, as indicated in the sketch.

The best operation will be had if a regulated voltage (105v.) is applied to all plates and screens.

Referring to the sketch, the grid condenser of the second 1625 (V2) is soldered to the fourth turn from the top of the ceramic coil which is the existing plate coil of V1, a small hole being drilled in the chassis between that coil and the tube recesses to carry an insulated wire to grid of V2.

Check all earth connections and finally remove the original screen bypass and replace with a 0.01 μF. ceramic disc and by-pass the 1625 filaments at the socket!

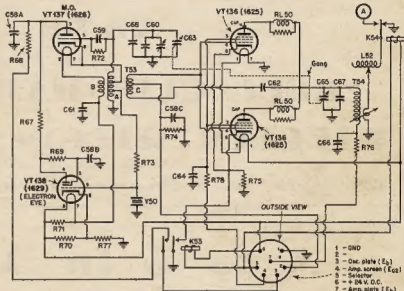
The output coils in the switched section are resonated to the required frequencies after the co-ax lead is attached to S1 by means of a g.d.o., and

C1 is used to peak them up. They should be about 1 inch diameter and connect to a buswire which connects two screws at the front of the chassis, one each side.

The rest is self explanatory, but if troubles occur, a letter to the writer will be replied to.

The 1629 magic eye tube is a direct replacement as an oscillator for the 1626 and seems to do the job better!

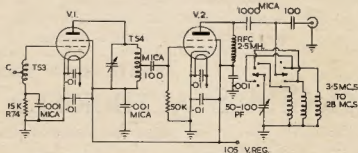
VK3TW now uses the one described herein, and a 90-minute QSO a few days ago did not necessitate retuning the receiver during the contact, while talking to him.



Original circuit diagram of BC458.

- C58A, C58B, C58C—0.05 μF.
- C59—0.00018 μF.
- C60—Master oscillator padding.
- C61—0.005 μF.
- C62—Fixed neutralising.
- C63—Master oscillator tuning, 350 pF.
- C64—0.002 μF.
- C65—Power amplifier tuning.
- C66—0.01 μF.
- C67—Power amplifier padding.
- C68—3.0 pF.
- C69—50 pF.
- K53—Transmitter selector relay.
- K54—Transmitter output relay.

- L52—Antenna loading coil.
- R87, R72, R73—51,000 ohms.
- R88, R76—30 ohms.
- R68—1 megohm.
- R70—1,000 ohms.
- R71—120 ohms.
- R72, R74—15,000 ohms.
- R73—200 ohms.
- R76—51 ohms.
- RL50—Parasitic suppressors.
- T53—oscillator coils.
- T54—Amplifier coils.
- Y50—Crystal unit.
- 7-prong female plug, outside view.



T53—Existing oscillator coil of 1626. (See the original circuit diagram of BC458.)

T54—Existing ceramic plate coil of V1. Condensers not indicated are ceramic disc.

* Sheilbourne Court, Morningside, Vic.

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A HIGH EFFICIENCY PLATE MODULATED CLASS C AMPLIFIER

★ A recent development in the Broadcast field increases the output from a Class C amplifier to 90% of the total d.c. plate input.

FOR nearly three decades the power output from a good quality plate modulated Class C amplifier has run between 66⅔% and 70% of the d.c. input—the Australian Broadcast Control Board, in its Standards, taking 66⅔% when using the indirect method of rating the power of a broadcast station.

Now comes a revolution, for the new R.C.A. BTA-5T, 5kw. broadcast transmitter operates its Class C amplifier at 90% plate efficiency.

Details were given by I. R. Skarbec in the March 1960 issue of R.C.A.'s "Broadcast News."

The method of achieving this great increase in efficiency is just about as simple as falling off a log.

The circuit arrangement is very similar to a standard plate modulated Class C amplifier except for a parallel tuned circuit in series with the plate and another similar resonant circuit in the cathode circuit.

Both these resonant circuits are tuned to the third harmonic of the fundamental r.f. frequency.

When these circuits are properly adjusted, the r.f. output wave-shape is no longer sinusoidal, but becomes relatively flat near the peak, and results in a plate efficiency of 90 to 92%.

When the Class C amplifier is driven, the harmonic content of the grid input power sets up and maintains circulating current in each of the parallel tuned third harmonic resonators. The resonators are designed to store high kva., therefore the total voltage supply at the anode is composed of the normal d.c. plate supply and the super-imposed oscillatory potential equal to that built up across the plate resonator.

This oscillatory voltage, being at the third harmonic, vectorially adds twice to, and subtracts once, from the fundamental, thus producing a flat-topped wave form.

When the cathode resonator is adjusted to the third harmonic, the instantaneous grid to cathode potential modifies the cathode emission to approximate a rectangular pulse.

An improvement of six to seven per cent. is obtained from the anode resonator and the balance from the cathode resonator.

All this adds up to a reduction in anode dissipation.

Should the resonators be mis-tuned, the amplifier returns automatically to the usual type.

Tuning up is similar to the conventional amplifier tuning but the dip is much broader.

Life tests on a number of valves showed no deterioration due to the new system, whilst the frequency response and distortion meet broadcasting standards, plus or minus 1 db. 30 c.p.s. to 10 Kc.

Three per cent. distortion at 95% modulation with better than 2% over most of the audio range.

It is understood that the new 50 kw. transmitter for 3WV Horsham is using this system, but with fifth harmonic. This is an S.T.C. job.

—VK3AXU.

SIMPLIFIED SKYWIRE SYSTEM

HAVING devoted lots of time, care and study to design of the new transmitter, we proceed to use lots more hard work to building it. Finally it's just the way we want it and generating the proper amount and quality of r.f. energy which we now proceed to feed to antennae.

At this point troubles seem to crop up, if observation of various antenna set-ups, and remarks on the air, are any guide.

We all know that the feedline impedance should match that of the antenna feedpoint or lots of that precious r.f., so laboriously generated, will be dissipated in the wrong manner!

A popular and simple approach to the antenna problem is a dipole, centre fed with a line of 72 ohms characteristic impedance. It seems to matter little whether it be twin-lead or co-ax. from the practical standpoint, notwithstanding contentions of the theorists that the feeder must be a balanced line, e.g. "twin-lead."

One well known firm, for instance, make a centre connector for feeding dipoles with 50 or 72 ohm co-ax. and what is more, it works!

At this location the frequencies for which a wire antenna is required, are 80, 40, 20 and 15 metres and is in the form of three dipoles with a common feedpoint and 50 ohm co-ax. feed line.

The tri-band beam here is atop a 50 ft. telephone pole and this latter is the support for the above mentioned dipoles, the lengths of which were determined from formula $468 \div \text{freq. in}$

Mc. to suit the portion of the spectrum desired, viz. 3.7 Mc., 126 ft. 6 in.; 7.1 Mc., 66 ft.; 14.25 Mc., 32 ft. 9 in., and of course 7.1 Mc. is also 3/2 waves for 21.3 Mc.

The low-frequency (80 metres) wire happens to be bare hard-drawn 16 gauge copper, but 7/20 would do. A 3-inch Pyrex insulator can be used at the centre if no special type is available and each arm of the low-frequency dipole is then 63 ft. 3 in.

The other two dipoles are made up using sections of open 300 ohm t.v. feeder (not the polythene tape variety), so that there is 16 ft. 4 in. each side of the centre insulator; to one wire of each arm is added sufficient wire of similar gauge (about 18 gauge) to increase the length to 33 feet each side of centre. This one is the dipole for 7 Mc. and the 3/2 wave for 21 Mc. The remaining dipole of 16 ft. 4 in. is for 20 metres. If one wishes a further dipole can be hung on for 10 metres and would be approximately 16 feet long or 8 feet each side of centre.

The easiest method of support is to use a single pole and to let the outer ends droop on each side to fences or what have you.

Some few years ago, "QST" had an article on "drooping-dipole" antenna and work on them suggested a feed point impedance of 50 ohms or thereabouts and I found that a "Monimatch" agreed with that, for there was mighty little reflected power using 50 ohms co-ax. (RG8/U).

RG58/U, the small diameter co-ax, is splendid for this use, at powers in

use in VK and "Telcon" market it as PT45/M and is reasonably priced, new.

At some locations three and more dipoles are to be seen fed in many ways, even including P.V.C. lighting flex as feedline!

With a well designed antenna coupler, of course, one dipole will do—the low-frequency one—and some t.v. open wire 300 ohm feeder will serve perfectly to feed it, but the multiple dipoles are easy to make, give a near-perfect match of feeder to antennae, and require simple support. There's no need to be anxious about erecting this array for I use it and it does work!

The use of 50 ohm co-ax. permits working of a pi-network into the line and it seems that this type of coupler is now pretty commonly used, in final amplifiers.

The array could be fed with 72 ohm twin-lead—"Telcon K20"—but this may give a small mismatch and poses the problem of making baluns to work into a pi-network.

The small booklet "S9 Signals," by Wm. Orr, W6SAI, could be of great value to many of us.

The construction of the drooping dipoles is a matter of individual choice and supports offering, and there can be several variations, of course. The main thing is that they have a common feeder and feed point and we do not need five separate dipoles and separate feeders around the house, to enable the use of the five bands from 80 to 10 metres—with a single pole to support the array!

—VK3JK

THE SCR522/542-A V.H.F. EQUIPMENT

PART ONE

THE SCR522 series v.h.f. transceivers have, of recent years, been perhaps the most readily available item of disposals equipment.

It is proposed in this article to deal with some of the conversion possibilities of the equipment, and its ancillaries, and to briefly outline the theory of operation of the unmodified equipment.

The SCR522 was designed to provide two-way communication, on four channels, within the range 100 to 156 Mc., with a power output of 8 to 9 watts. The associated receiver has a sensitivity of 3 to 4 microvolts input for 10 milliwatts output at 10 to 1 signal to noise ratio.

TRANSMITTER—BC625

The transmitter operates on any one of four crystal controlled channels in the range 100-156 Mc.

The crystal controlled oscillator's plate circuit is tuned to twice the crystal frequency which is 5,360 Kc. at 100.08 Mc., and 8660 Kc. at 155.88 Mc. (The 2 metre band crystals lie between 8 Mc. at 144 Mc. and 8220 Kc. at 147.96 Mc.)

The 6G6 oscillator output is then fed into two tripler stages (a 12A6 and 832) to emerge at 18 times the crystal frequency to drive the 832 p.a. stage.

Two 12A6 tubes in push-pull are used to amplitude modulate the carrier, whilst a 6BS7 tube serves as an a.f. speech amplifier when relay 131 is released or as an audio oscillator when relay 131 is energised by an external "contactor". This facility was used of use if m.c.w. on 2 metres is required.

The only other tube on the transmitter chassis is a 6BS7 tube connected as a diode and used to detect the presence of r.f. at the p.a. plate tank coil. The rectified r.f. thus obtained is filtered and may be read on position 4 of the transmitter metering switch.

R.f. output is taken via an adjustable link, coupled to the p.a. tank coil and feeds via the serial change-over relay to the co-axial socket on the FT244A type rack. This facility was omitted in some models.

RAK—FT244A

The FT244A serves as an interconnecting medium for the transmitter, receiver, antenna, power unit and remote controller. The rack secures to the transmitter and receiver units per eight screws (painted red) and provides inter-connection wiring, channel change motor mounting, antenna relay facility and external cabling connecting sockets. Note that the antenna relay is actuated in the receive position—de-energisation of this relay places the antenna to the transmitter.

The larger multi-pin connector connects to the controller, whilst the smaller connects to the PE-94 or PE-98 power unit.

● A new series upon popular disposals items which, by the kind co-operation of the author, will feature different units from time to time.

RECEIVER—BC624

Three principle variants of the receiver are available, these are the BC624A, AM or C. All receivers operate on any one of four pretuned crystal controlled channels in the 100 to 156 Mc. range. I.f. is 12 Mc. The local oscillator operates below the signal frequency and is 11 times the oscillator crystal frequency from 100 to 108 Mc.—12 times from 108 to 116 Mc., 13 times from 116 to 124 Mc., 14 times from 124 to 132 Mc., 15 times from 132 to 140 Mc., 16 times from 140 to 148 Mc., and 17 times from 148 to 156 Mc. Receiver oscillator crystals for any channel fall within the range 8 to 8.72 Mc., the appropriate harmonic being selected for injection to the mixer by correct setting of the receiver oscillator tuning head.

All receivers employ one stage of r.f. amplification feeding a mixer stage. Local oscillator injection is inductively coupled to the mixer. The local oscillator train consists of half a 12AH7GT with a selected crystal between grid and ground and having a resonating inductor in its plate circuit. The oscillator feeds a harmonic generator which, in turn, drives a harmonic amplifier—both these latter stages are tuned by a two-gang differential capacitor coupled to the oscillator tuning head knob.

Three stages of i.f. amplification at 12 Mc. are employed.

From the detector stage onwards the various receiver models differ somewhat. The BC624A employs a 12C8 det. a.v.c., 1st audio; half of the 12AH7 plus relay 246 for squelch, and a 12J5GT for audio output.

The BC624AM employs a 12H6 tube for noise limiting and a.v.c. delay functions, but is otherwise similar in its audio circuitry to the BC624A.

The BC624C differs considerably from the A and AM versions. The tube line-up from the detector onwards is: Detector and noise limiter, 12H6; a.v.c. delay and 1st audio, 12AH7GT; a.v.c. detector and 2nd audio, 12C8; audio output, 12A6. The second 12AH7GT valve, which serves as the crystal controlled fundamental oscillator, has its second triode employed in an electronic squelch circuit, the threshold point of which may be set by adjusting potentiometer 238A.

The audio output impedances available are 8,000 ohms at terminal 5 of transformer, 200 and 600 ohms at terminal 4.

A metering point is provided on all receivers, for A and AM units the r.f. amp. plate current is metered, whilst

A. G. MULCAHY,* VK2ACV

in the C series the i.f. 1 cathode current is metered. The idea was to observe a.v.c. control on plate current as an indication of equipment operation.

POWER UNITS—PE-94 and 98

These units provide all h.t., bias and i.t. voltages required by the equipment. Outputs available are 14.5v. 49a., 150v. negative at 10 mA., and 300v. at 280 mA. The dynamotor has both series and shunt fields and a regulated shunt field for voltage stabilisation. Current consumption (28v.), on transmit, is 11.5a., and 11.1a. on receive. Current drawn in 14v. installations is double that on 28v.

Circuit diagram of the transmitter, BC625, is shown on the opposite page. Some suggested modifications will be given in Part Two to appear next issue.

★

NATIONAL FIELD DAY CONTEST

Contestants in the above contest are reminded that their logs should be set out as indicated in the Rules published in "Amateur Radio" for January 1960.

All entries must be post-marked not later than Saturday, 4th March, 1961, and addressed to the Federal Contest Committee, W.I.A., Box 851J, G.P.O., Hobart, Tas.

PHOTOGRAPHS

The Editor requests all contestants in the National Field Day Contest to send in photographs of on-site shots for publication in "Amateur Radio." Each photograph received will be returned to the sender, and a prize is offered for the best photograph submitted.

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- ▶ Fast heating element, ready for operation in less than one minute.
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- The ORYX long life element will outlast several bits which are of tight push-on fit.

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Model 6 1/16" (Fixed)	6	6	0.25 oz.	6"	Electrical measuring instrument fine assemblies, hairsprings, R.F. pick-up and speech coils, hearing aid sub-assemblies, etc.
Model 6a 3/32" (Push-on)	6	6	0.25 oz.	6"	As for Model 6 (for extremely delicate work only).
Model 9 5/32" (Push-on)	6, 12, 24-27½	8.3	0.25 oz.	6"	Hearing Aids, Radio and TV Sub-assemblies, Coils, Electron.c Instruments, Model Construction, Electro-Medical, etc.
Model 12 3/16" (Push-on)	6, 12, 24-27½	12	0.5 oz.	6.25"	Radio, Television, and Telecommunications assemblies.
Model 18 3/16" (Push-on)	6	18	0.75 oz.	7½"	For heavier work, heat capacity equivalent to that of most 80 watt soldering irons.

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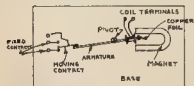
MSP3.58

A POLARITY SENSITIVE IMPULSE SWITCH

B. M. OLIVER,* VK2ZLM

THIS unusual type of switch is really an elementary form of relay, but "latches" into position after each pulse until another pulse of opposite polarity moves the armature. It could possibly be referred to as a bistable switch.

Construction is simple as only two essential components are needed. One headphone bobbin (preferably high impedance) and one small fairly powerful horseshoe permanent magnet. The remainder is odds and ends.



Components can be mounted on any non-magnetic base including wood and plastic materials.

A strip of mild steel of the same cross section as the pole piece of the headphone bobbin is needed (or can be cut and filed up) 6 inches long. The bobbin is placed as shown and the pivot arranged at the balance point to avoid undue wear. Fasten magnet securely. Old relay contacts provide the working contacts in any desired arrangement.

OPERATION

Spring return push button—

- (a) Two battery source (or tapped battery).



Note.—Double contact button to prevent damage if both buttons pressed together.

- (b) Single battery.



Only a short pulse should be needed if properly made.

This is not a high speed relay, however.



"Don't worry about the rope breaking. I've plenty more at home!"

SOME ANTENNA IDEAS

TAN MACMILLAN VK3JDO

NEVER (Remember!) HAVE BEAMS OR COPPER IN CONTACT WITH ALUMINIUM OR DURAL

Clearance between beam & loop $\frac{1}{8}$ "

1" white and plated steel nut & bolt

SAMPLE

DURAL WIRE ELEMENT

Beam

Head of short aluminium

THIS METHOD BEST FOR WIRE ELEMENTS

Self tapping screw (cold plated)

Beam

Beam

ANOTHER WIRE ELEMENT TYPE

PIVOT SUGGESTIONS

1. HALF IN BAR

2. NEEDLE POINT

3. POINTED STEEL ROD FIXED TO ARMATURE

4. CUP SHOD ARMATURE

5. BRASS TUBE ON SPINDLE WITH BRID WINDMILL

THIS METHOD DUE TO VIBRATIONS—ELEMENTS UP TO $\frac{1}{4}$ " DIA.

Element

Beam

Clamp

Saddle

Off ground with chain

Pinch & mount CHAIN connector with two screws on driven element saddle

TV TYPE SADDLES ARE USEFUL

Beam

TV TYPE SADDLES ARE USEFUL

TV DIPOLE ENDS MAKE GOOD GAMMA CLAMP

See sketches for details, rest is ingenuity. Ideal for battery transmitters as drain is nil and can be made much smaller if required with miniature coil; the miniature magnets can be obtained from old M/C meters.

Don't forget the residual gap or the armature will stick. Thin copper foil strip, copper rivet (or go de luxe and fit adjustable screws to the pole pieces). If the armature coil is light, armature mass small, and properly balanced with short travel and a powerful magnet, this operates in any position, otherwise horizontal please.

Mounting a connector on a small boom—due to VIBRATIONS

TV DIPOLE ENDS MAKE GOOD GAMMA CLAMP

Waterproof gamma condenser box

Pinch three holes in the pill box lid & mount the condenser & wire it up. When it is adjusted screw the box on the lid, and tape the lot to the boom.

A WATERPROOF GAMMA CONDENSER BOX

Connector mounted on element saddle

Pill box

Pinch

TV DIPOLE ENDS MAKE GOOD GAMMA CLAMP

* 8 Edward Street, Oatley, Sydney, N.S.W.

A VK's Comments upon other Countries and their Hams

MOST of us I am sure have a desire to visit overseas lands and meet different people. I have just returned from a most wonderful six months tour of Europe, Scandinavia and the U.S.S.R. As most of my time was spent visiting various DX Hams, I am writing this article for "A.R."

Unfortunately, I am not an author and my words will fail to express what a tremendous and spontaneous welcome I was given. After many years as a DX phone chaser, last April I decided to go and take a look at some of the people whose voices I had heard so many times.

My first encounter with a Ham overseas was with Folke SM5BFA in Stockholm. I had his telephone number and as soon as my train pulled into Stockholm, early on a Sunday morning, I went to a public telephone and called his number. All was not simple when his XYL came on speaking the SM language. After two minutes the call cuts out (a good idea for our public telephones) and as I had no more coins, Mrs. SM5BFA was still in the dark as to VK3TG being in Stockholm. After much trouble I got a further call and this time the OM answered it.

Many of these DX Hams can only talk "Radio English" and find it next to impossible to carry out a normal English conversation. After further trouble I finally made the QTH of Folke.

A king could not have been given a better reception. Folke's two harmonics thought I was a man from the moon, coming from VK. I was taken to meet many SMs and as it was cold and I had no overcoat, my host came to the rescue. Even in Stockholm one cannot buy overcoats on Sunday (mine had been previously stolen). This overcoat I still wore as my boat left for OH that evening.

My very good friend, Axel OH5NW, was to meet me in Helsinki but we had trouble as neither of us knew each other's face. Axel solved the problem by using a large p.a. system. "This is OH5NW calling VK3TG." This brought about our meeting. Later at his QTH, 70 miles from Helsinki, I was introduced to Carol, his XYL. OH5SM, Finland proved a most delightful country and altogether I spent about three months there.

For many weeks I stayed with Axel and Carol, and most of my time was spent in the Ham shack. Conditions to VK were not good, and I only managed

one QSO with VK3UW. Never again shall I complain of QRM here. That European QRM has to be heard to be believed. On my fourth day I visited an OH5 club, and the local press was present. The boy from Australia made front page news next day in the OH5 area. I made many visits to the club in Helsinki. This club exchanges its monthly magazine with "A.R." and I still wonder how the boys in Melbourne understand that Finnish language. A Ham is employed full time to run the club and organise activities. There is a smaller club called the "Columbia Radio Club" (C.R.C.). Each week day the Helsinki Hams gather at the Col-

perusing war surplus shops in London. Ham gear is very cheap there and I could have filled the ship's hold with bits and pieces if I had the db. and had known a nice custom man in VK. My time in G was all too short and the only DX man I met was G2PU.

In Paris I missed seeing Hams, but my night at the Folies and the walk home after have been censored.

My next host was DJ1CS in Solingen. Verner had a popular make of DJ car and he took me to see the sights and also on a shopping spree—the prices of electrical goods and cameras, etc., are just ridiculous in West Germany. They are one-third the price we pay here.



Members of Lymington and District Radio Club. Front Row (l. to r.) John, Club Sec. and S.w.I. Jack, VS6CL/G3ODJ, Art, G3JAP. Second Row Derek, S.w.I. John, G3LLW, Nick, G3NRH. Back Row: Phillip, S.w.I.; Anthony, S.w.I., 1st harmonic of G3JAP, Ray, S.w.I.

umbia cafe for lunch, here everything is discussed except Amateur Radio. I was the first VK to visit there and I enjoyed many free meals and received a gift from the C.R.C. of a technical book.

My journey into U.S.S.R. was most interesting, but I could not see any Hams there. Special permission must be obtained from Box 88 in Moscow before one can meet these boys. I had had enough red tape getting my pass port and visa, etc.

In Oslo I was met by Chris LA5KG, his fiancée and her girl friend made charming companions as we saw the sights on two motor scooters. The two days in LA land were far too short.

Next came England where I met my good friend Art G3JAF (he is called "the man with a tin"). Art got quite a shock when he saw my face after having over fifty QSOs with me. Jack VS6CL was in the area and we all had a night at the local club. Many hours were put in with Art and his friends,

Other Hams whom I contacted and whose call signs I can remember were: SM5CO, OH2MK, OH2XA, OH2YK, OHY2SZ, OH2TM, OH2RJ, OH2GR, OH2TM, OH2OK, OH2QE, OH2MA, OH5QN, OH5SL, OH5NG, LA5TF, G3LLW, and G3NRH.

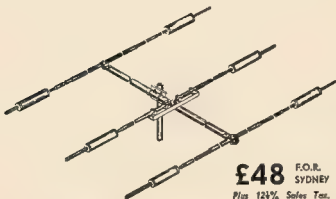
In Denmark, Italy and Switzerland I did not make contact with any Hams. Of course I had many weird, wonderful and sometimes frightening experiences. The day in VSI was most exciting. Being my first look outside Aussie, it brought about many surprises. Five of us from the boat hailed a taxi to take us from the harbour to the heart of Singapore. The Oriental driver drove like a maniac, through the most crazy traffic I had ever seen. Every time we passed a cop he pushed one of the YLs on board out of sight because four is the maximum number of passengers allowed. On arrival at our destination, he asked for fifteen dollars. We all argued with him and were pleased to beat him down to five dol-



Chris LA5KG.

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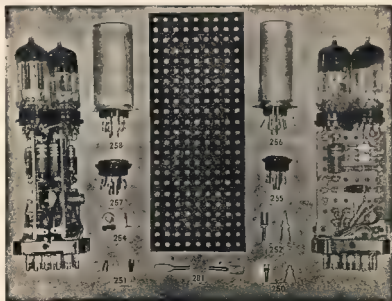
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Page 10

NEW!

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features:

- High accuracy achieved on waveforms in which peak voltage may be as much as twice the R.M.S. Not limited to sinusoidal signals.
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Specifications:

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Frequency Range: 50 c.p.s. to 20 kc.

Accuracy: $\pm \frac{1}{2}\%$ 0.1 to 300 v., 100 c.p.s. to 10 kc.

$\pm \frac{1}{2}\%$ 0.1 to 1199.9 v., 50 c.p.s. to 20 kc.

Input Impedance: 2 megohms in parallel with 15 pF. to 45 pF.

Power: 60 watts, 115/230 v., 50 to 400 c.p.s.



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30 METRE S.B. ACTIVITY

In an excellent position to hear most signals in Australia, John 4DD has been keeping a check on the number of VK sideband stations using the 30 mhz band. He reports that N.S.W. leads with Victoria second. Here are the figures by States:

New South Wales	40
Victoria	34
Queensland	7
South Australia	8
Western Australia	7

Tasmania, Northern Territory, New Guinea and the Australian Capital Territory have one each.

John is continuing to keep the check, details of which I shall give you from time to time. I wonder how long before these figures are

PERSONAL

We all are familiar with how helpful the Amateur fraternity is, one to another. This was borne out recently by the experiences of Dudley 2DQ, who keeps a lane vigil from far away Broken Hill. Dudley writes:

"I had a Collins 30MA 1.1 strip sent me by a K4, and the Ham Strip sent to the fore when, following my weekly talks with Noel 2ZF, the following came along: 'I have a 1.1 strip sent me asking for a wee piece of shielded braid, sent along enough for the job.' '30QWQ went into action after hearing my Green R 915 Kc. tuner and 45 Kc. strip sent along 1370 xtal which works like a charm.' 'JARR had me a much wanted 6AK5 which was not procurable from my suppliers.

"LALFO ditto, as they are readily obtainable in ZL, and I could not get at the socket to change for an available tube.

"Certainly makes one think that the sidebanders are a 'listening and acting' crowd."

"Noel 2ZF came to the fore when I mentioned that the 485 Kc. 16 Kc. wide mesh filter in the strip (along with the 3, 4 and 8 Kc. wide jobs there) served no purpose and the beautiful vertical slopes made me think that a xtal in the right spot with an a.f. filter to restrain the bandwidth would probably be the trick in my new exciter; he wound up some toroids and selected condensers, and, on checking it the lads like the present audio cutting off at 2.5 Kc. performance we shall let you hear the new tx on either 80 or 30 one of these fine days.

"And have since heard the new 2DQ tx and it sounds very fine. No wonder his call is now known as VK3 Delightful Quality!

NORTHERN TERRITORY-VK3

John 2QJ has arrived back from his round trip to Darwin. John operated mobile with a KW32 from VK4, 8, 5, 2, 2, and 1. While in Darwin he visited Eddie 8OW from whose home Chuck 8TB has been putting VK3 on the a.b. map under the 30W call sign. However, Chuck now has his own call, 8TB, and it is anticipated that he will be heard from Darwin for some time to come. Chuck, who is a Philco Systems Engineer, is attached to the Air Force. He is using a KW31 and 2 1/2" 8000 beam and has helped with VK3 and WDDPF back home in the United States.

Wireless Institute of Australia

Victorian Division

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Theory is held on Monday evenings, and Morse and Regulations on Thursday evenings from 8 to 10 p.m.

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Secretary W.I.A., Victorian Division, P.O. Box 38, East Melbourne (Phone: JA 3835, 10 a.m. to 3 p.m.), or the Class Manager on either of the above evenings.

DX

(Continued from Page 19)

27H. VS10, ZE1HC, ZE1RM, 5A5TA, 80IAA, SM3KV/605 Eric received a card from KG6M which now makes him 259 countries contacted by ham.

Don 13887 is now listening on 6 mhz with a crystal converter into an AR7 He will be concentrating on this band and will not be listening on other frequencies any more at the moment. Hrd. 14 Mc. c.w. DL2Z, G3ET, G3IC, J3A3A, J3A1N, J3A1F, J3A1O, V3RD, H3RD, W3, Y3PST, 14 Mc. l.a.b.: G3JFK, K3M3H, K3G3A, H3A3B, K3R3G, Y3PWI, a.m. MP4TAC C.w. J3BCW, F3B2Z, R3Z1B, K3M3H, K3W3D, K3P4C, L3U3H, J3Z0P, MP4T, V3QRT, V3R1R, V3U3R, V3U3D, Y3S4P, Z3A4C, K3Z1Z, S3A3T, 31 Mc. s.b. 5Z, 6A0W, a.m. VS3GS, K3R3M, 31 Mc. c.w. K3R3D, 50 Mc. 1389N, J3A1CY, J3A1C

Dave J389N heard the 14 Mc. band fairly good most evenings with some Europeans coming through, and plenty of UAs from Asia. 3.5 Mc. c.w. hrd.: 5P3HK, F3E1Z, DL1QK, 14 Mc. c.w. hrd.: PA3KMG/K3E1Z, 14 Mc. c.w.: UA-01Y, UA3V, UA3U, J3A3C, UA3RD, V3U3B, V3U3P, T3ZCM, J3A1PT, J3A1B, O3H3M, RV3HT, DU3OR, H3K1Z, K3R3F, V3V3A, V3V3B, V3W3A, W3A3A, W3A3B, 31 Mc. c.w. J3A3QZ, UA3V3, VS3GS, VS3AF, O3S3H, W3L3ND, U3R3KA, K3NEV.

QSL RECEIVED

BERE-198 KOICED Marcus is. L3A3G Jan Mayer, LZ1AG, M1/W3PBD, UL7KA, UP1AC, VQ1SC, VR1L, VS10, VY1AD, 4X4XC.

VK3QL: EP1AD, ZE1W 7 Mc. FO1XF, U3AD, UO3FK, 8J1AA, T3MF.

VK3ER: ZD1AW, VS1GS, Z3L3B, VU3ZW, X3B3B, J3Z0P, U3BK3K, DL3E3, DL3C3R, CX3P3, 173 cards received for the month including 37 from listeners.

VK3AB: AC3CQ

ADVERTISEMENTS

FQ3HP—Box 41, Braxaville, (24L). H3R1P—via W3OZL (24L).

OD3CT—Box 3443, Beirut, (24L).

W3O1L/F3P—Prof. E. J. R. Washington D.C.

U.S.A. (BERE-198 and 32L).

H3K1C—via K3OVN, (BERE-198).

HK3Q—Box 100, Barranquilla, Colombia (BERE-198).

VK3AJL—Melbourne C of E Girls' Grammar School, South Yarra, S.E.1. Vite. (BERE-198).

J3ZPM—Paul Meyer, Agos, Netherlands, New Guinea (4DO).

F3BCW—Hicini, P.O. Box 153, Diogo Suis, Madagascar, (4DO).

YN1CAA—Does not QSL as yet YN4AB, (3YD).

YN4AB—Hans Henrick, Siumd via Managad, Nicaragua (3YD).

ZM3AB—C/o, Faleolo Airport, Western Samoa.

Several letters of late show that many of us are in the same position as VK3ARX with regards to those much wanted QSLs to build up our DXCC confirmations. He suggests an "address wanted" list run occasionally may get the QTH from someone who has already received a card. In his case the Bureau, airmail sea mail, 14 QSL managers, etc., have been to SUI, 40 countries in this situation.

To overcome, partly at least, this outstanding "Addresses Wanted" column will be given a try, starting in the month of March.

I again wish to thank Don Cheater, Burlington, Kentucky, for the use of his DX Magazine in compiling these notes. Also thanks for the many letters received from VK Amateurs and Listeners. 73 John.

GOING S.S.B.?

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A.C. RIFFLE

Does that weak carrier that you can hear in your own rx sound absolutely 197? If it does not, try adding an additional section of filter to the power supply to the carrier oscillator. You will probably be very pleased with the result. Just a word of caution, be careful about the placement of the filter choke. Make sure that hum is not induced in it from the power transformer.

CARRIER SUPPRESSION

How often have you been told that you have some carrier showing? This report usually makes you go through the carrier balancing procedure all over again and often you have been easily misled. For instance, if your signal is 40 db. over 57 at the other fellow's rx, and you have a carrier suppression of 40 db., your carrier level will be 59! So before you get the screwdriver and test gear out, make sure that this is not just a case of very good conditions.

S.B. ACTIVITY IN "Q" LAND

The following is an extract from the Oct. 1960 "Sidebander" magazine—the publication of the Single Sideband Amateur Radio Association—and is an up-to-the-minute resume of s.b. activities in the U.K. It was compiled by Ted Hayes, G3KHE, the S.B.S.A.R.A. representative in England:

"10 Metres: A few stations equipped, some small activity but not a popular band, mainly because of the limited frequencies available. (15hp-30w transmissions nearly every 5 Kc.).

"30 Metres: The main band for s.b. in 'Q'. Most contacts are made between 3.5 and 3.7 Mc. During the winter months, transatlantic QSOs are possible and this can be very useful to many newcomers to s.b., making their first efforts to work on this band. European stations are also operating the above section of the band. During the night hours, some really good DX can be worked.

"40 Metres: Little activity on this band, mainly due to the limited frequencies now planned for European Amateur, but daylight QSOs are heard around 7.053 Mc. This band could be very good for dawn (G.M.T.) West Coast contacts; many Ws have been copied with 59 signals at this QTH around 0800 G.M.T.

"50 Metres: Still the best band for real DX in spite of the extremely poor conditions that have prevailed during the summer months. An increased number of new G calls being heard and, with the availability of commercial 7A, I would forecast that the present number of active G stations on this band will be at least doubled by next Spring.

"15 Metres: Apart from the regulars that remain 'faithful to fifteen', there is not a great deal of activity due mainly to the fact that only a small percentage of the b's in use can operate on the band.

"10 Metres: Ten has been well and truly down in the doldrums for the last three months to little or no s.b. activity has taken on 80 and 20. The two Amateur magazines in circulation here have recently both contained very good constructional articles, in particular by G3DAP, and considerable interest has been aroused. The shortage of suitable filter crystals has become more acute which could mean a lot of construction work being undertaken.

"At the present time, we only have one English-made commercial tx on the market. Surprisingly, the price is comparatively low—costing roughly 350 dollars, complete with power supply. For rx's, the choice is not so limited, and these cost anywhere between 150 and 250 dollars with a new Edystone rx in the 1200 dollar range."

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

BIRDCAGE AERIAL

Editor "A.R.", Dear Sir,

My attention has been drawn to the correspondence which appeared in the September issue of "A.R." relative to the Birdcage Aerial. It is agreed that a V dipole has little directivity on its own. However, when a V dipole is placed apex to apex with a similar structure on either side as a director or reflector an X type array results which is superior to the normal two element array with parallel elements, normally referred to in this country as an "H" array.

The improvement, in particular as regards front to back ratio, is so marked that X type arrays have almost entirely replaced H arrays for television reception in Great Britain. In the London area alone there must be nearly one million X type arrays in use, and it seems probable that a similar trend will become evident in Australia as the t.v. industry develops.

The Birdcage is essentially two horizontal X arrays stacked vertically and fed in phase so as to provide increased gain and concentration of radiation at a very low angle. As in any other type of array, the precise length of wire for resonance is a function of wire diameter. Readers will doubtless recollect the fierce arguments which used to take place regarding the precise length of wire required in the loops of a cubical quad!

The Birdcages manufactured by the Minnitter Co. and sold in considerable numbers in the U.S.A. are fabricated with tubular elements of one inch diameter. Any attempt to reproduce the X array using thin wire elements would naturally result in failure unless the dimensions were suitably increased. In the latest version, the parasitic element is tuned as a director, giving a further increase of gain, and the tuning stub is replaced by a small inductor which results in a more neat and tidy appearance.

—G. A. Bird, F.Inst.P.I., A.B.I.R.E. (QAZU),
Technical Director, Bird Patents Ltd.

his block" in the streets of dignified Melbourne, caused me to embark on this letter. Which prompts me to raise the question "How balanced are we?"

To add further weight to my initial remarks I solicited the aid of a business acquaintance currently employed on market research in a senior executive appointment with one of Australia's top manufacturing and marketing companies. (Incidentally he can tune a receiver quite well and read Morse but has no interest in our hobby.) He has a natural flair for analysing a situation and forming his own conclusions—conclusions which, his business, means the expenditure of a substantial portion of his company's revenue budget. The task I set him was to analyse the frequencies between 14000 Kc. and 14350 Kc. and determine the relative activity of the three modes, c.w., a.m. and s.b., between 8 p.m. and 11 p.m. on week days and on Saturdays and Sundays—morning, afternoon and evening. His report, which is listed below, makes interesting reading and surely substantiates my belief that we could well rid our band, especially 14 Mc. of c.w.

DAY	C.W.	A.M.	S.B.
	%	%	%
Monday	—	8	30
Tuesday	—	7	10
Wednesday	—	10	15
Thursday	—	5	15
Friday	—	5	30
Saturday morning	nil	5	95
Saturday afternoon	15	15	70
Saturday evening	30	15	75
Sunday morning	nil	10	90
Sunday afternoon	15	15	70
Sunday evening	15	10	70

These figures were taken over the full period and averaged. To the foot of his report he made the following observations.

"Although the s.b. stations are far more active they are all concentrated in a small sector of the band whereas the others seem to have plenty of space which is not used. While my figures show the degree of activity they do not show the quality of the picture as the s.b. is conveying a far greater amount of communication due to the duplex type operation; the c.w. and a.m., on the other hand, repeat so much of their material."

This all makes interesting reading, especially as they were taken out in a November week when conditions were fair to good and no

contests operating. I was amazed at the low a.m. activity; the abnormally low c.w. and s.b. was, of course, to be expected. The old die-hards for c.w. want the frequencies just to use them when and if they want them and will fight hard tenaciously by the written word in "A.R." to retain them. Surely this is as selfish as one can get.

If my hand allocation submission is not acceptable it is up to us to operate a.m. and s.b. from 14000 Kc. up. If the top 100 Kc. are not needed by c.w. then let those whose frequencies are cramped move in.

The figures from my friend's research exercise prove beyond all doubt that very few are interested in c.w. today, that s.b. is growing rapidly in popularity due to its outstanding efficiency and more frequencies are needed for the latter. The sooner we rid our ranks of c.w. the better for all concerned. Surely the will of the majority must prevail.

—Roth Jones, VK3BG.

★

THE MIDDLE RANGE OF DX

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MULTI-OPERATOR CLUB STATIONS

Editor "A.R.", Dear Sir,

I am writing on behalf of the Northern Command Signals Amateur Radio Club. We have made a study of the new section for multi-operator club stations in recent contests. We feel that there may be sufficient radio clubs, etc. in Australia to warrant the inclusion of such a section in future contests.

Such a move may go a long way toward increasing club spirit and stimulating interest among the younger members of clubs, particularly those who have not yet completed station building, or perhaps have not yet qualified for the A.O.C.P. The club group may be able to operate under supervision according to the "Handbook".

We would be pleased to see further correspondence on this subject.

—B. W. Bertlett, VK4UW, President, Northern Command Signals Amateur Radio Club.

MORSE CODE

Editor "A.R.", Dear Sir,

I feel sure that my old friend Roth Jones is having a lot of fun. Anybody who has QTH VK3BG on c.w. would confirm that he is one of the best c.w. operators in the game.

However as a good publicity man he may have deliberately omitted his name in order to draw attention and bring about discussion on a just cause.

The trend today appears to be away from c.w. operating towards s.b. We traditionally associate s.b. with a.m., but a few moments to each mode will surely convince one that s.b. and c.w. are closely allied. A sharing of frequencies between s.b. and c.w. seems a more logical position than that of s.b. and a.m.

—N. Roberts, VK3NR.

Editor "A.R.", Dear Sir,

Since the publication of my considered observations on a more rational approach to the allocation of our frequencies, particularly on 14 Mc. it has certainly met with a mixed reception from congratulatory letters and telegrams to abusive letters. One chap even "did

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him some cakes that he got any. As in past years, Mr. Stobbs, with a couple of assistants, served the coffee and very nice it was, too, so the year finished with quite a delightful evening and topped off an entertaining and interesting year of talks, lectures and films. Of course John Gray spoils things by telling untrue stories about your correspondent; if he is not careful I'll spell his name with an "e". Several v.h.f. boys have been very active lately—ZAYL, Z2MO and Z2NW have been making the Sydney boys talk to them. Miss Z2MO now has a rotube five-over-five and a well modified SCR323 and puts five-and-nine Sydneyside. Stuart Z2DF has joined the ranks of T.V. idiots but after a few days of it went to the States for a holiday. I thought Tonya had returned to Sydney. There was an excellent roll-up at the Bils 2XT's joint, and he visited and dined the boys around the billiard table, thanks Bill from all of us. Associate Tony Mullins has gone and done it, but no doubt we will see him in due course; congrats to you and yours, Tony. Harry Z2FA, a stranger these days, is in the pink of health and as he hasn't had a game for a long time I took him around to Zulu Lulu so that Bill would win at least one game of billiards in 1960, but alas it was not to be. Sorry to hear that Ernie Z2F will soon be hospitalised, hope you are out before this appears in print.

Next meeting boys, Friday, 10th. Will you be there?

— . . . —

VICTORIA

SOUTH WESTERN ZONE

The Zone has lost one of its earliest and best known members with the passing of Leigh H. Forty metres can never be quite the same without his distinctive voice and the Old Timers' Net, of which he was the mainstay, seems to have passed with him. Our sympathy goes to his wife Mary and their family and to John SAGD.

Now that the holidays are over and the harvesting season is well advanced has been noted again in the Zone. Static and the lure of DX has curtailed activity on 80 mhz though. Reports from Graham ZLJGZ indicate that the night owls Etn Z4EXZ and Danny Z4DD are still burning the midnight oil. Just shows how deep your scribe has to dig to get news

from next door. Graham is the owner of a very nice s.a.b. signal and is looking for VK contacts on 80 mhz. Before the s.a.b. scribe gets his foot on my back, I must mention Neil 31IG, who is very close to his 100th country, on sideband now and also Chris Z4XU has plans to eliminate the carrier.

The 20 mhz band has been letting quite a lot of VK3 signals come through here, one of them belonging to Norm 2NC. Welcome in the notes Norm! Norm spends his time on 20 mhz and is well up in the DX listings on the c.w. side. He uses, if my spies are reliable, 20 watts and an umbrella of 600 ft. vee beams from his shack on the hill.

Talking of DX, we believe some was coming through to Ballarat recently and a certain honourable gentleman turned the wick up a trifle too much and the modulation transformer went up in smoke. Rumour has it that the power transformer exploded; it also, precluding any attempt to substitute a brass modulator. However, whatever the cause, Wally 3UT, we miss 3UT.

Some new calls are noted within the Zone. Welcome to Eric 3XL and Lindsay 3ZKL. Eric is on 80 with both phone and c.w. Lindsay has gear ready for 350 Mc., using p.p. 718s and super regen and looking for starters. Looks like Bill 3ZL is resting from the labours occasionally. (Who said this was the holiday season?) Bill has a tx for 253 Mc. but as yet no receiver.

V.h.f. activity is increasing again in the Zone with the 50 Mc. openings. At long last we have logged Bill 3ZFG with his 150 wts. Bill was too busy however with the VK4s to respond to a call from the west. Eric 3AJX has dragged himself away from 2 metres to keep in touch with Peter 2FX who has taken the mobile to VK3 again.

The holidays brought Peter 3ZAV with his portable rig seeking high spots. It was reported that he would be on Mt. Napier but evidently Peter doesn't like the fumes up there, and who can blame him? Tiger snakes and Ham Radio don't mix too well. Instead he and his offider set up in the fire spotters cabin on Mt. Rouse from where they made some good contacts and fooled at least one local listener who thought he was hearing 2 mhz sigs from Geelong.

The holidays brought many of the Zone members down to the coast, amongst whom we found Kevin 3AKR at Warrambool with his

power boat. After a burn around Lake Perle and witnessing a masterly performance on skis by Francis Desailly, Brian 3XX has been bitten and talks of forsaking the shack for the lake with a home-brew boat. So far he has no takers for the skis but Bill 3ZL is snubbing at the bait. We are pleased to hear that at long last Brian has shed his armoured shirt.

Well known station to Zone members is Jack 3APL. It is nice to hear that Jack is on the job again after a long spell off work and not too busy to have no time to spare for that new rig. The new rx there has a commercial front end, 85 kc. i.f. strip and all modcons. The new tx will run the limit with provision for s.a.b. with a T/R switch for break in. He has also completed a transistored s.d.s. ranging to 40 Mc.

Dick 3ABK has an occasional QSO on 40 with the newwicks and on 20 with a.m. d.s.b. as you order. Pat 3ADN comes up occasionally on 80 mhz, but too much DX about on 20 for John 3ABK and Harry 3KL. John is a regular with the Warrambool group on 50 Mc on Sunday evenings too.

Don't forget the W.I.C.E.N. practices chaps and please note the time is now 230 hours on 3500 kc. until further notice. Also please make a note of our Melbourne link—Bruce 3ASN and Bob 3AUK. Bob and Bruce, who are father and son and operate at the same address, are formerly VLSs from the Casterton network and as they both work at the same place near their home, are prepared to open a channel to the city for emergency traffic on call. The telephone numbers are 37-3302 at home and XY 3451 at work, so if you find yourself in a spot with emergency traffic, call someone and get them to ring Bob or Bruce.

MOORABBIN AND DISTRICT RADIO CLUB

The new Committee is as follows: President, Arthur 3AWO; Vice-President, Ken 3ACX; Secretary, Alf 3LC; Asst. Secretary, Harold 3APQ; Treasurer, Peter 3APD; Committee, Ken Seddon, Harold 3AUP, Ted 3AUP, Don Maycroft; Auditor, Ian 3AXC, Film Librarian, Laurie 3CIN, QSL and Certificate, Bill 3ZE; Transmitting, 3SVT.

The new syllabus provides for activities as follows: Five crazy whist nights, three barbeques, three 80 mhz tx hunts, three film nights and a white elephant night, as well as a mid-

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TYPE 66

P.A. use where less low frequencies are required than the 65 with a lift in the middle frequency to ensure high output without feedback.

TYPE 67

Communication use, has a further reduction in low frequencies than the 66 and increase in high frequencies for intelligibility through noise.

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OBITUARY

THOMAS LEIGH SIMPSON, VKKH
With deep regret we announce the passing, after a long illness, of Mr. T. L. Simpson, VKKH.

After his early schooling at Hamilton and District High School, he went on to Technical College. From there he went to the Ballarat School of Mines and then joined the firm of Messrs. R. B. and T. J. Tipple as an electrical engineer. Then came World War I, and young Simpson joined a Light Horse Regiment and saw service during 1915-16. After the war he returned to Australia in common with many other cavalry men he transferred to flying and as a pilot served the rest of the war with the 1st Squadron A.C. in the Middle East. His exploits brought him the awards of the Distinguished Flying Cross and the Belgian Croix de Guerre.

With the end of the war, Leigh went on to the property "Snail," at Dunbeld, and started his long life of public service. He became a councillor of the L.L. House Shire and represented them and the Municipal Association in many spheres. This took him, amongst other things, to the Glenelg Regional Committee and in interest in the port of Portland, and to the Country Fire Authority from 1944 to 1946.

In 1935 he took his Amateur license and the call VKKH became his. He is well known on 40 m. Later when the lettered number plates were issued, he registered car number 1 VKKH, thus making it quite explicit the distinction of being the only Australian Amateur to display their call signs on their cars.

He had particular interest in mobile work and with the call sign of VLJJP and later VLJVA was one of the original members of the Western Rural Fire Brigades Network, which calls out fire engines as families to Bremen as did VKKH to Amateurs.

Mr. Simpson was an Elder of the Dunbeld Presbyterian Church and he served his district well as a trustee of Alexander College. Naturally his interest in radio brought him into association with the Flying Doctor Service which was the family of the Simpson family. Brother Dr. George Simpson, whose death occurred only a short time earlier, made the first flight to an isolated area.

Among his other interests were the Glenelg Base Hospital, of which he was one-time president, commissioner and life governor. He was also a member of the Hamilton F. & A. Society and the Hamilton branch of the Grangers' Association. During 1945 he was president of the World War Veterans' Association.

Mr. Simpson was a keen field naturalist and a keen yachtsman on Lake Lindisfarne. Lately he took up the sport of golfing and visited Benalla regularly for this purpose.

He leaves a wife, two daughters, a son, and two grandchildren to whom we extend our deepest sympathy. He leaves too a public life and place in our lives which can never be filled for such men are rare.

Year party, annual picnic and Christmas party. Many visits are being arranged and lectures very from technical subjects to travel.

In conjunction with our theory class we now have a more code class held every Thursday evening. The best of the theory class is planned to participate may do so by simply joining our club. Contact Alf Chandler, VKKLC, at 1013 High St., Armadale, or by telephone BY 2913.

...

QUEENSLAND

PILOMBAGE FOR PROGRESS

For some considerable time VK4 Division has felt that there must be more greater co-operation between metropolitan and country members in matters of vital importance in the administration of the W.I.A. in Queensland. This has been a long time in planning in the remote south eastern corner of the State and industry and commerce have found it necessary to have a more active co-ordinating branches in the larger provincial towns.

The Division thought decentralization was the answer and, as my XVI, Jess, and I were proceeding northwards on holiday, I decided to do a little more planning. I planned before the country chaps the advantages of forming further branches, particularly in Rockhampton. This was the first of a series of visits of the various towns within the hurricane-prone

area and offering W.I.A. personnel and equipment to the local committees for use during periods of national disaster.

Now Jess and I are only a few microamps off sixty and orchard, I have a Derby-and-John existence, but when the 22nd August, 1960, dawned bright and fair, Derby and John became back and forth started off in a new Holden station sedan and I was the procession of southern travellers following the sun.

MacKay - Arrived 25th August, 1960, and contacted Pioneer Shire Clerk and other local committee members. MacKay is a town which is in a hurricane-prone area, is well and truly organised to meet the impact of any such disaster. Dr. I. Charles, of the Government Medical Officer, has the most emergency set-up in the State. I arranged for John 4PVL act as liaison officer between MacKay and the committee. John is a school teacher, amateur theatre enthusiast, sailing instructor among many other things. During afternoon tea with John and M. Miller, I found John had some excellent equipment and a dream of a tower.

Townsville: Townsville and Rockhampton are so strategically situated, geographically, that, together with Brisbane and Maryborough, they would be ideal centres from which W.I.A. affairs could be conducted. I was particularly nearer than members in the remote areas could have greater participation and representation in our activities. I met and discussed with the status have formed the Townsville Amateur Radio Club and, although it is not affiliated, most of its members belong to the W.I.A. Upon arrival at Townsville I met the club secretary, noon tea with Bob 4RW. Bob is our staunch supporter in the north and is editor of the "A.R." notes. Dinner with Bob 4RW, who used to like me, and then with Bob proceeded on a shuck crawl after collecting Frank 4PF. We finished up at the shack of Eric 4W, where there was a real gathering of the clan. I here met Charlie 4BQ for the first time and I believe Charlie still likes me. I was invited to address a meeting of the T.A.R.C. on 29/8 when I was welcomed and received further hospitality at the hands of President Alan 4PS and his mother, Eric 4W, and Bert 4LJ.

I had formed the opinion that Townsville Amateurs could not entirely see our point of view. The T.A.R.C. is a most enthusiastic band of Amateurs and its affairs are conducted in strictest accordance with the W.I.A. rules, perhaps, that they would resent any suggestion that the identity and present status of the club would be lost by absorption into the W.I.A. as a branch.

My address to them included the following as an argument for the formation of a branch:

1. I mentioned that the R.S.B.A.I.L.A. had seen the need for decentralisation and had divided its members into sub-branches. I pointed out that the members of the sub-branches, and their families, told that we would follow their example by forming clubs, sections and branches in our Division with the Divisional Executive in Brisbane composed of delegates from each branch.
2. Each branch would have complete self-government or autonomy in the local sphere and could appoint its own committee of members, issue certificates of membership, badges, etc., under delegation from the Division and answerable only to the Divisional Executive in Brisbane. I gave them concerning the State or Commonwealth.

Each member would have greater participation in W.I.A. activities in that a branch would be able to do more things, could, by being channelled through the appropriate bodies, quite possibly be adopted as world-wide procedure.

3. Each member would have greater representation in W.I.A. activities.
4. As an approved branch any motion submitted by them would affect all members, if adopted, and not just those in any one particular area.

Twenty-one members were present at the meeting. Five apologies were received and I met and two further apologies were received by me personally. I received a most attentive hearing and the meeting was pulled, and if the gulf was not closed it was narrowed to the extent that it could be bridged by greater understanding on both sides. No decision was made. I gave an undertaking that I, personally, would do nothing to disturb the harmony of the club by trying to form a branch which would include only a few of their members. I gave them hope that the Townsville boys will form a branch and that their first job as a branch would be to advise the T.A.R.C. as an affiliated club in their area.

Cairns: Arrived in Cairns on 10/9/60 and there met a very dynamic personality in Basil 4ZW, who hitherto had merely been a voice giving plenty of cheek over the air. Also Bob 4W and John 4W, who were both in the club and his XVI Zoo saw us on every one of the 19 days we were in Cairns and did everything possible to make our stay enjoyable. A meeting was arranged and was held at the meeting I arranged for the appointment of Basil on the local committee, the secretary of the Cairns Flying Doctor Service, the Flying Ambulance which conducts the Flying Ambulance. As a reciprocal measure the Ambulance Radio Operator, Charlie Harrington, was appointed treasurer of the Far Northern Radio Club and a 3 k.w.a. transportable generator was made available to Basil for emergency power supply. The visit to Cairns was a highlight of the 4SM was a highlight of the Cairns' visit. Arthur is 70 years of age and his interest in radio dates back to 1911. Arthur and I personally talked about pl circuits, Browning Drakes, Loftin Whites and generally had us a good time.

The Cairns meeting was duly held and 10 Amateurs were present including Harry 4OH from Mossman. The Far Northern Amateur Radio Club was formed with Basil as President and Harry as Secretary. The club members of these northern boys are real keen and some came 100 miles to our meetings.

Atherton: A Saturday afternoon meeting was held at the Atherton Hotel. The club members being present. Thanks to Harry and XVI for their hospitality on this and other occasions and glad to hear that your son passed his 4SM. The Atherton 4XMA travelled up from Mt. Garnet.

Tamale: Arrived 24/10/60 and visited Clive Auchmuty and arranged with the Shire Clerk, Mr. Webb, for the appointment of Bob 4TK as Liaison Officer. Met Bob and XVI, Eileen, and daughter and enjoyed their hospitality. The club members of these northern boys are real keen and some came 100 miles to our meetings.

Ayr: Arrived 30/9/60 and enjoyed the hospitality of Claude 4UX and his XVI. Jess for the first time. The club members of these northern boys are real keen and some came 100 miles to our meetings. A meeting was convened and convened at the Shire Hall and the club members of these northern boys are real keen and some came 100 miles to our meetings. A meeting was convened and convened at the Shire Hall and the club members of these northern boys are real keen and some came 100 miles to our meetings.

Rockhampton: Perhaps I may be pardoned for saying that my visit to this town of over 45,000 souls was the highlight of the trip. Frank 4PVL, who was the first to meet me, was steeped in W.I.A. lore and great was my pleasure when I learned that the Mayor of Rockhampton, Mr. A. B. Milburn, M.L.A., had by public notice, called a public meeting at the Town Hall for the purpose of forming a branch, on 8/10/60. The Mayor was enthusiastic about Amateur endeavour and initiative especially from the point of view of national emergency and the provision of a service to the community. The Mayor was very enthusiastic about Amateur endeavour and initiative especially from the point of view of national emergency and the provision of a service to the community. The Mayor was very enthusiastic about Amateur endeavour and initiative especially from the point of view of national emergency and the provision of a service to the community.

Wendy: Most Amateurs in this town, and in the State, are members of the club. Wide Bay and Burnett Branch and occasion was taken to address the gang at the weekly A.C.P.F. classes. The club members of these northern boys are real keen and some came 100 miles to our meetings.

Wide Bay and Burnett Branch: This is the largest branch in the State. It was formed on 9/5/59. Gordon 4OH is President and he has shown that the branch has the capacity to endure and develop. Classes are regular and the membership has increased 100 per cent, since the inception of the branch. T.v. teams are active in the club.

It is my firm conviction that the life blood of enthusiasm must be spread throughout the State through the medium of clubs, sections and groups so that members in remote areas may participate in our activities.

Classes: One of our greatest sources of recruitment is the provision of courses. Our greatest lack is a good correspondence course that would be available to all members. We gratefully acknowledge our indebtedness to the club members who have given a course supplied to VK4 members. We now understand, and appreciate, that it is impossible for Norm to continue to supply in the numbers we require. The club members of these northern boys are real keen and some came 100 miles to our meetings. Federal Executive might consider the possibility of having courses printed or runned in all parts of the State and the various States for a fee of course.



SEMI UNIVERSAL - 40 WATT Modulation Transformer TYPE MT 30

SECTION A—PRIMARY TERMINALS: ANODE 3, C.T. 4, ANODE 5

Modulator Ohms A-A	R.F. Amplifier Load Resistance and Secondary Terminals						
	8-9	8-10	8-11	8-12	8-13	8-14	8-15
2000	1000	1500	2000	2500	3000	4000	5000
2500	1250	1880	2500	3120	3750	5000	6250
2800	1400	2100	2800	3500	4200	5600	7000
3000	1500	2250	3000	3750	4500	6000	7500
3400	1700	2550	3400	4250	5100	6800	8500
3800	1900	2850	3800	4750	5700	7600	9500
4000	2000	3000	4000	5000	6000	8000	10000

SECTION B—PRIMARY TERMINALS: ANODE 2, C.T. 4, ANODE 6

Modulator Ohms A-A	R.F. Amplifier Load Resistance and Secondary Terminals						
	8-9	8-10	8-11	8-12	8-13	8-14	8-15
2000	570	850	1140	1420	1710	2280	2850
2500	710	1070	1430	1780	2130	2850	3560
3000	850	1280	1710	2130	2560	3420	4270
3400	970	1450	1940	2410	2910	3880	4850
3800	1080	1620	2180	2700	3250	4350	5400
4000	1140	1710	2280	2850	3420	4560	5700
5000	1430	2140	2860	3570	4270	5700	7150
6000	1720	2570	3430	4300	5120	6850	8600
6600	1890	2830	3770	4710	5650	7550	9400
7000	2000	3000	4000	5000	6000	8000	10000

SECTION C—PRIMARY TERMINALS: ANODE 1, C.T. 4, ANODE 7

Modulator Ohms A-A	R.F. Amplifier Load Resistance and Secondary Terminals						
	8-9	8-10	8-11	8-12	8-13	8-14	8-15
2000	400	600	800	1000	1200	1600	2000
2500	500	750	1000	1250	1500	2000	2500
3000	600	900	1200	1500	1800	2400	3000
3400	680	1020	1360	1700	2040	2720	3400
3800	760	1140	1520	1900	2280	3040	3800
4000	800	1200	1600	2000	2400	3200	4000
5000	1000	1500	2000	2500	3000	4000	5000
6000	1200	1800	2400	3000	3600	4800	6000
6600	1320	1980	2640	3300	3960	5300	6600
7000	1400	2100	2800	3500	4200	5600	7000
8000	1600	2400	3200	4000	4800	6400	8000
9000	1800	2700	3600	4500	5400	7200	9000
10000	2000	3000	4000	5000	6000	8000	10000

The following example shows the use of the chart:—

(1) Modulator load impedance: 3400 ohms A-A.

(2) Class C Amplifier D.C. voltage: 550 volts.

(3) Class C Amplifier D.C. current: 130 mA. (4) Class C Amplifier load resistance: 4250 ohms $\frac{(2)}{(3)} \times 1000$.

(5) Class C Amplifier power input: 71.5 watts $(2) \times (3) \div 1000$.
Locate the Modulator A-A load impedance of 3400 ohms in the first column. Sections A, B and C all list this value but the required secondary load 4250 ohms is available only from terminals 8 and 12 in Section A. Use primary terminals 3 and 5 (C.T. 4) and secondary terminals 8 and 12. Other impedances may be obtained within the limits shown in any one Section of the Chart by multiplying or dividing the primary and secondary values on the same horizontal line by the same factor.

Maximum D.C. voltage: 130 mA. each side of primary.

Maximum D.C. current 130 mA. in secondary.

Power rating: 40 watts, for modulating up to 80 watts input to a Class C Amplifier.

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-S. J. Armstrong, VK4SA.

Gordon 4GM regularly on 7 Mc. and has even been heard on 18 Mc. Arch 4CB, in between tv. openings, working some far countries on 21 Mc. phone-FQ8 is the latest. Con. Lacey, zone secretary, now picking up after a spell of ill health. Here's hoping for better health in '61, Con.

Ron 4BG back to his old haunts on 14 Mc. c.w. Doing better since re-connecting the feeders to his folded dipole. Grahams, ex-4DJ, will soon be on under a VK3 call. Bill 4SW is mainly operating on 7 Mc.

The New Year is now only a few days old. Just wonder how many has made the new resolutions and broken them already.

Conditions on the various bands have not been the best, though at times 21 Mc. opens up for some choice DX to appear. Have been lucky enough myself to land EP3 and AP3 on phone for new countries, while on 14 Mc. managed to make a contact with FBXX on Kertzenen Is.—his first QSO for 1961.

Pleased to hear the southern boys on 80 Mc. calling the Z boys in Ayr during the Contest. At times good openings, but so far this year Contest scoring is below last year's Ross Hull Contest.

Very pleased to hear old voices back on T Mc. Frank 4FC at Ingham has a new resolution to let the grass grow while he calls CQ Alec 4MA from Mt. Garnett put in spare time on the band, while Harry 4IK uses a portable rig while re-building—very nice signal and f.b. modulation. Basil 4ZW still wastes away the time talking to Bob 4TK and dodging the washing up. Charlie 4BQ took off for the Tabletop but think he'll be back soon; nice way—long enough. Bill 3ALY moaning around the north, so far has not called, maybe too busy with Bob 4CB in depressing 207s.

How many read the article in Readers' Digest for January, "Calling CQ". Key to airwave adventure. Very nice to show the scoffers and a boost to the many who are hoping someday to do the same.

The monthly general meeting of the Division that has the least number of "Squares," to wit, the V63 Division, was held in the club room at the Hotel Commodore on Tuesday, May 10, 1938. More than half of the same meeting last year, and took the form of the usual Xmas "Get-together." The meeting was a very successful record for this type of meeting by one, and again proves just how popular this gathering is, even in the face of the "square" and "round" sundries. Official guests included Mr. Kerr from the Emergency Fire Service, Mr. Traynor and Mr. Pike from the New York City Police Department, and a number of celebrities about which I am unable to say anything, owing to the fact that somebody purchased the visitors' book, but I am sure that the V63 Division and its members all thoroughly enjoyed themselves and the convivial spirit displayed throughout the evening.

The President and Chairman of the Division, Lloyd SOX, opened the meeting and read out the list of new members, and the meeting proceeded in a very lively way. The first item on the agenda was the election of a new President. The President-elect was elected by a large majority. The President-elect then gave a short speech, in which he expressed his confidence in the Division and his hope that the Division would continue to grow and prosper. He then announced that the Division would be holding a meeting in the near future, at which time he would be presenting a paper on the subject of "The Future of the Division." The meeting then adjourned.

Now if you have read the opening of this month's notes, you will have by now discovered that 131 members were present, which means that one member did not second the motion and despite the hostile glances from 130 members present, Luke EL stood his ground, or perhaps it should be, at his seat, and exchanged glare for glare. All of those standing immediately called out "Division." and before you could say a.b., those foolish

enough to sit up for the division remained standing all night, and those canny ones who called "Division" were comfortably seated with grins on their faces like cheshire cats. "Take a little rest," said the President, "and then we will have a little more of this." In the next life he had said the wrong thing and spent the rest of the night explaining to the standers. "Suppers and at the same time relieved the President of his duties. The next morning this was going on, the President had become a sobbing wreck at the lack of business acumen shown by his friends of money, and he had lent gently away by one of his sympathetic councilors toward the kitchen, from whence for some considerable time his grief-stricken presence could be heard. "The next day, getting ill, the President of Coke bottles was dropped on the head. To save further embarrassment to all concerned the lights were turned out and the President disappeared. The hastily erected tent was then closed.

Three films were shown, a Walt Disney story about the busy Beaver (I had an attack of conscience half way through this film!), an excellent cartoon on the common cold, and a short on the importance of brushing your teeth. The latter was a chance to sharpen up their teeth for supper, an extremely interesting film of the well known VK4 coral reef. I have seen quite a number of films at our general meetings over the past years, and I can say without any fear of contradiction that these three films were outstanding. The first was the best I have ever seen, and a pat on the back goes to Neil MZAW who arranged the screening.

At this point in the proceedings the chairs were moved back, the tables were set up, the goodies were brought on, and all present gave thanks to God for the food and the escape from disaster struck. It was discovered that the milk supply was not east, and consternation reigned supreme. Apologies were the order of the day. I was suddenly brought to mind, it was unfortunate that it had to happen. Several stories went the rounds concerning the fact that the milk was not east. I am not sure I subscribe to the one which said that Doc BMD left it until dark to get the milk and thought it was Strawberry he was dealing with. I am sure that his money was not east was Ferdinand. He was still puffing when he reached the meeting, but I am not one to judge by appearances, although he did appear to be a bit out of breath.

Les SLC used further consternation when he had the audacity to ask for a spoon to stir his tea. I was so shocked that I searched every available cupboard the missing spoons were found. Wouldn't it just be like Les to ask for a spoon to stir his tea! He is probably the only person in the world who would do so despite all these distractions, everybody seemed to enjoy the goodies, and as usual the members of the Home were keen to see the young folks of the Home. I was taken to the Matron of the Home extends her grateful thanks for remembering them.

It was a very good night which was thoroughly enjoyed by all present, and reflects great credit on the members of Council who were responsible for the arrangements, and I was very glad to see that the tea was carried from the supper room to my car by sixteen or seventeen of the members, I was very glad to see that their efforts and could only say "Thank You".

Jim Paris was in charge of the food preparation in the kitchen, and must have put on two or three stone in weight from the beginning to the end, judging by the bulges in the most unlikely places, but after all he did a great job and could be pardoned for sampling the wares now and again, after all he wanted the best for the muscled!

Cec EBZ was noticed to the fore at the meeting and was looking well following his recent trip to the Snowy River scheme in VK3. Cec, as you know, is one of the Trustees of the VK3 Division and a master of the spoken word, which he suavely demonstrated when I said I was bad luck about there being no milk. "Oh that is nothing," he graciously said, "I don't drink milk myself!" "I am alright"

A real old-timer in Arthur Cotton (R-SH) came up to the meeting and said that he had left my little bit of supper in the kitchen, for which I somewhat surprisedly thanked him. Several more of the members also came up and told me the same. Suspecting something afoot, I made a few judicious enquiries, only to find that Keith SKH had announced over the SWI session to bring a basket supper and a little bit for "Pansy."

Arch SXX, the Prime Minister of Lactodale, heard on 7 Mc. on New Year's Day working all and sundry. Announced that Joe SJO was his house guest for the week-end and was still wrapped in the arms of Morpheus. Heard Joe later and he sounded quite fit and well. Un-

heard on N.Y. morning be-

meaning the poor conditions on the band for N.Y. eye and not being able to exchange seasonal greetings with any of the boys. I cap it all, he said that the planes were flying up and down the passage all night and slanting in and out of the clouds. He said that the SMZ paying a visit to the S.E. including Mt. Gambier, and by now has returned to the big smoke quite convinced that the S.E. boys are a great bunch of fellows. Was heard plaintively calling for Carl SSS before he left, but no Carl could be heard. You should have made a bet on Eddie Frank, that would have brought him out.

I thought that I had heard everything in Amateur Radio, but I never thought that I would ever hear Luke SLL say that he never turned the radio on at all during N.Y. eve. Seems that t.v. claimed his attention and he forgot, of course it might have been because his outlook was a little sour at the time, he broke an axle on the last day of the year!

George BEK, our local certificate hunter, added another one to his belt last month when he received his much sought after W.A.P. certificate. The number of the certificate was only 10, which leads me to believe that it will sojourn on Wilkes some time this month, and end up home among George's rare ones.

Brian OCK (ex-SZCK) arrives home from his to celebrate his return to the land of civilisation he will walk up the stairs with Gwen. No further information available on Gwen except that she is a VK3 but I have my spies at work and expect all of the gen any day now. Joe JO has been maintaining skeds with him for some time and possibly, he will give me all the details if I put the vacuum pump to work.

Norm Colman the who is addicted to diving down treadpools into cellars and looting on his head is up and about again and looking for information on Buck SDA is that he is making slow progress toward his normal health. In-chitis myself, but did anybody ring me up and enquire about my health? Did anybody ring me up to enquire about my health? In what condition at the general meeting? Did anybody give me a cheerio over the SWI session? Did anybody give me a cheerio over the SWI session? Would some be well again? The answer is no. I repeat NO, and why? Simply because Coun-cilman is not a member of the SWI. The SWI is clamped down with a news blackout, even though they knew I was uncertain as to whether to take a shovel or a harp. I am going to the quick.

This Morpheus joker must have got around a bit on N.Y. morning. He had got a strange hold on Keith's SWI. When the rock failed to go in, Keith said for his usual SWI apology and did his usual fine job on the session. That clippy-clop sound that was in the background of the session was the first time that he let his tongue dragging on the ground, so they tell me. You should have heard the mob ducking in and out on the frequency saying "Hello Feet" and then having a quick listen. When Keith said "I'm not doing this," the audience reaction Keith, they did everything except shout and whistle and stamp their feet. Keith SLG would have done that too, only he couldn't get them more than three inches of

One newsbreaks when or where one may come in contact with would-be or ex-Amateur. The other day my XYL tricked me by saying she had heard her husband's account of my cold and before I knew where I was the doctor was ushering the door bell. My wife let him in, ringer him into the house, and he said "What was your complaint?" He complimented me on my athletic figure and muscular build, and then on my asking him when I could go back to work, he said, "What do you want to broadcast? What is your best broadcasting station in the Commonwealth, if not in the world, and was some-thing amateurish about it?" He seemed very keen on radio, especially Amateur Radio. He said that he had been down on several occasions to Doe SMD for some code practice, but he felt that he was being kept from prevented him going on with the ticket. Well we had quite a long talk on the hobby of radio, and he said he was going to get his license. He was going on, my wife was pacing up and down outside the bedroom door prepared for the worst. Finally unable to stand the uncertainty, I called to him, "Get out of the bedroom door and with a very welcome face."

said, "Is he very ill doctor?" The fact that the said would-be Radio Amateur Doctor was sprawled across the bed demonstrating the GAZU beam was the only part of his examination in a couple of boxes of pills did not improve the situation, and by the time that my wife had finished her thesis on Radio Amateurs in general, she had clambered into bed with me in self defence.

Although he left the house in quite a hurry we managed to get out of him that the germs are not coming from VK3, well, he said, and believe it or not, on checking through the thousands of cards from VK3, well, hundreds anyway, sure enough on a card from Ken 347 I found there were strange little men drawn in ink on one of the pages and plainly labelled germs. Well, how do you like that, and I said, "Well, how do you like that, and I'm concerned. Never mind, my turn will come, I've got a team of germs that will lick them any day, but what made me take to my bed the fact that after Joan had seen that book on aeroplanes and kidded me up a tree, she had to have a hand in such a dastardly plot. My faith in womanhood is broken for ever, well for a while anyway! Joan, how could you?"

I have it on good authority that the regular session of Council will take place at the end of this 1960-61 financial year, and strangely enough all those giving it away are in no way disgruntled or sour, it just happens that the scientific types and the like have caught up with them all at the same time. Of course I have been sworn to secrecy and cannot say the President, the Vice President, the Secretary, the Treasurer, the Federal Councillor, and a couple of others will be throwing in the towel, but no doubt you'll hear it from someone or other, and if you do, don't forget that I gave you a little hint. Wow! Even I might have to go back on the record, where I said that if it was so good, I wouldn't be able to rubbush us, nor would us be able to punish I. Oh dear, oh dear!

I said Keith to blow down the ears of all of my spies over the W.I.A. session on New Year's Day, the first of the month and no news whatsoever. Well, you should have seen the number of spies that got the impression that I was Simon Legree, although just as my Uncle Tom I will never know. However, it was the secretary after the fact that Tom 37L from Benmark came dashing in with his reports the next day, and had even extended his activities to Alice Springs.

A local Alice boy by the name of Graham Jenkins has passed the Z license under the coaching of Frank RAE and will be doing something to the tune of £1000 in licence and circumstances permit. Nice work Graham, and you too Frank, if everybody gets one more into the ranks, our chance of survival gets better, and I might as well say of numbers always counts with officialdom.

Les SUX by this time will have taken up his residence at Alice, and will be wielding his office at the Alice Springs Post School as headmaster. He dropped me a line to say that he was looking out for a good rx as he was tired of the noise of the V.K.S. and he can one bet. The place is teeming with them Les! Not too much of that cane old boy, whacko, fancy getting six hands from that tank man's muscle, given with his usual smile, no doubt.

Fred SMA not very active on radio at the moment, but he is still a member, and a "standby" in this hot weather, and has had a number of interruptions to both leisure and number, because of being wanted elsewhere. A struggle BPC is being raised for the winter preserving season and is spending a lot of time washing jars and bottles for the apricots, etc., and probably will be quite active on the air during the jam season. I have cleared six shelves in my pantry, Otto, will that hold it all?

Tom 347 is happy again. He is no longer making appearances in the national programmes for the A.B.C., although he has not stayed off the air to achieve this distinction, and has been sitting around with a new station and that he acquired from a certain VK3 disposal shop and reports good results. So much so, that he has written a series of the content of the side of the dial for the VK3 journal, which I

will have great pleasure in delivering to them. Nice work, Tom, wish that there were more like you. Not too many of course!

My wife and I at the same time matter of s.a.b. have given us both, and probably others, plenty of amusement, but I was stricken to the core the other day to receive a letter from Stan 347, who had apparently written me on the back and kicked me in the park where I stick out the most. I am that used to VK3 never taking me seriously that I did not for one moment think that anyone else would, and say nothing of the fact that I did not think that my humble efforts in the magazine would be read by any other person, but I received something of a shock to note that my remarks possibly could have offended, unconsciously on my part, a number of the addicts of s.a.b. To them, and to others, and others who have made the mistake of taking me seriously on perhaps some other subject, I offer my humble apologies. I never realised that I had the power to offend the passions of man with my pen!

Half of VK3 must be on holidays travelling around and around, judging by the post cards that I have received following my aforementioned request to Keith 5W1 to crack the whip around my team of spies. One card was addressed to Miss P. Parslow, who was sent on by me to my daughter, only to be returned to me by my son-in-law (whom I think has always been a little dubious of me) with the suggestion that the P. was meant for Penny, and the sender was Spy 999, or better known as Frank 5M2, temporarily based at Mt. Morrell, where he has the time of his young life visiting all the local boys. Apparently his accident rating is still OK because at the time of writing no reports appeared in the paper of anyone falling in the Blue Lake! Interestingly, Frank took the passing of Jim 3LM pretty hard, they were a little more than rabbits, but Frank describes him as a real "White Man".

Another card from Joe 5JO who is apparently on a round trip which this one came from Currency Creek, where he is now. (In the money, Joe? Get it! In the money, Currency Creek. Oh I am a wit, I am killing myself! Anyway, Joe called on Pat 8CM and the son 8KN, and they had a fair time, fixing up the local goggle boxes and therefore only have time for Amateur Radio when emergency occurs, according to their past record anyway.

Received a long letter also from a new spy in Frank RAE from Alice Springs, confirming an earlier paragraph, regarding the money and also details of the Alice Springs Youth Centre, which I am keeping for next month. Many thanks.

My abject apologies to the Elizabeth boys, no notes this month. Ian 5QX scribbled me out a few at the Xmas meeting, but on looking back I find that I was complaining as to how tough ones of the Ham sandwiches seemed to be, apparently the said few notes got into that sandwich because I certainly can't find them. Oh well, nobody can say that I don't digest the news from my spies!

Just as I was putting these notes to bed, a couple of days late, suddenly I received from me that 57B (known to me as Wally Burford) had passed away a few days before Xmas Day. He had lived at Narracoorte for many years, and I shall miss him. I am sure that he was a VK3, and we in VK3 had lost touch with him. Lacking at the moment any details, there is not much to say except that I am sorry to hear the bad news and hope that his passing was peaceful.

TASMANIA

The club room fund has made considerable growth just recently, and the committee has received for which the committee and the Council are very grateful. In addition to donations, the auction of donated surplus gear at the December meeting has produced £23/7-. The final profit figure from the Cabaret held on 10th Dec. has not yet been determined. While the profit from this function grows, the committee will be working on the function as such. We have learned how to conduct such a function, we have learned the mistakes to avoid, and we will be working on the next such function, and there are two results which encourage the committee very much indeed. First, the social side of the function at the Clubroom has been well catered for, and secondly, the attendance from non-members and the publicity in the eyes of the general public can only be of assistance to us in the future.

Christmas has gone once again, and the portable stations heard were TCH, TKA, and TWP. As a result of the festive season, the attendance at the January meeting was far below

the usual meeting. We had a most enjoyable and instructive presentation of slides of various aerial systems presented by Len TLE, and the cordial vote of thanks afterwards was well merited.

Members may have noticed that our VKY Bulletin is now posted at bulk postage rates. It is regarded as a periodical with the Post Office. This result has been achieved by the joint efforts of Tom TALL and Ken TKA, and the result is that the Bulletin is going to constitute money per year. It was a job well done, chaps.

Remember the National Field Day Contest, an excellent weekend in February. Go out into the field if you can, or take part from home. Mike, of the Shortwave Listeners' Group, has limited an examination and has gained a full licence. Mike, however, is going to gain his code before taking out a call sign. Ted TZAU also hopes to gain his code and to have a full licence by the end of February.

Finally, as convener of the club room fund-raising committee, I would like to thank publicly Brian TBE and Myles TMT for their excellent and well-sustained work on behalf of the cabaret recently held. Although they did not do all the work, yet their efforts were excellent and substantially ensured the success the function undoubtedly was.

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